

BEFORE THE
POSTAL REGULATORY COMMISSION
WASHINGTON, D.C. 20268-0001

PERIODIC REPORTING
(PROPOSAL TWO)

Docket No. RM2022-8

PETITION OF THE UNITED STATES POSTAL SERVICE FOR THE
INITIATION OF A PROCEEDING TO CONSIDER PROPOSED CHANGES
IN ANALYTICAL PRINCIPLES (PROPOSAL TWO)
(July 7, 2022)

Pursuant to 39 C.F.R. § 3050.11, the Postal Service requests that the Commission initiate a rulemaking proceeding to consider a proposal to change analytical principles relating to the Postal Service's periodic reports. The proposal, to update and improve the methodology for attributing postmaster costs to products, is labeled Proposal Two and is discussed in detail in the attached text.

Respectfully submitted,

UNITED STATES POSTAL SERVICE

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Proposal Two: Update and Improve the Calculation of Variabilities for Postmaster Costs

Objective:

The objective of this proposal is to update and improve the methodology for calculating variabilities for Postmasters costs. These goals are accomplished by applying one of the variability calculation methods proposed by the Commission in Docket No. RM2020-2 to 2022 data.

Background

In Docket No. RM2020-2 (Proposal Ten), the Postal Service proposed updating and improving the attribution of Postmaster costs. After considering Proposal Ten, the Commission rejected it. The Commission cited four reasons for its rejection. The Commission argued that there were issues with the percentage change in WSCs that was used to calculate the variabilities, that there was a failure to demonstrate the robustness of the variability calculation based upon that percentage change, that clear criteria were not used in the sensitivity analysis that supported the choice of the percentage change, and that the computational method for the variability did not rely upon both increases and decreases in Work Service Credits (WSCs).¹

To its credit, the Commission did not simply reject the proposed variability method, but offered two alternative methods that would remedy the deficiencies in Proposal Ten.² The Commission also recognized the progress the Postal Service made

¹ See, Order No. 5932, Order on Analytical Principles Used in Periodic Reporting (Proposal Ten), Docket No. RM2020-2, July 8, 2021, at 45.

² *Id.* at 47.

in Proposal Ten and supported an effort by the Postal Service to further improve and resubmit an updated Postmaster variability analysis:³

The Commission appreciates the Postal Service's effort in updating Postmaster attributable costs. It encourages the Postal Service to consider the Commission's assessment, implement suggested improvements, and resubmit its request.

The Postal Service appreciates the Commission's guidance on improving the Postmaster variability analysis, and accepts the Commission's recommendation to rectify the deficiencies in Proposal Ten and submit a refined analysis. In doing so, the Postal Service will closely follow the explicit proposals the Commission put forth to resolve its concerns, without modifying those parts of Proposal Ten that were not of concern.

In sum, the Commission made clear that its rejection of Proposal Ten was focused on the method of variability calculation. In this docket, the Postal Service's proposal will directly address and improve that part of the Postmaster analysis, following the Commission's guidance.

Proposal

The proposal is summarized below, but a full discussion of the research supporting the proposal is provided in a report by Professor Michael Bradley, electronically attached to this Petition as a separate pdf file. Also provided separately, in USPS-RM2022-8-1, are the raw data, all statistical analyses, the calculation of the

³ *Id.*

variabilities, a public analysis of the impact of the new variabilities, and all associated documentation. A non-public analysis of the impact of the new variabilities on attributable Postmaster costs is provided under seal in USPS-RM2022-8-NP1.

The first of the two variability calculation methods proposed by the Commission was termed the “Large Sample Version of Proposal Ten Variability” (LSVPTV) method.⁴ This approach addresses the Postmaster variability discontinuity issue through analyzing the variability calculation under the assumption that there is an infinite number of post offices in the two grades for which the variability is calculated. That is, the LSVPTV approach asks what the variability formula would look like if, instead of having the actual number of offices in each EAS grade, there were an infinite number of offices in the two grades. This assumption turns the discontinuous structure of the actual Postmaster data into a continuous probability distribution.

The LSVPTV approach calculates the limit of the variability function as the change in WSCs goes to zero. Taking the limit permits re-writing the variability function in terms of the probability distribution for WSCs (which is continuous) instead of the change in the number of offices in each EAS grade (which is discontinuous). However, the WSC probability distribution is unknown and must be estimated in an additional analysis before the variability can be calculated.

The second variability computational algorithm proposed by the Commission was termed the Minimization of Error Distance Between Predicted and Actual Cost

⁴ See, File A5: Suggested Approaches to Address the Shortcomings of Proposal Ten, Library Reference (Suggested Approaches), PRC-LR-RM2020-2/5, Docket No. RM2020-2, July 9, 2021 at 1.

(MEDBPAC) method.⁵ It was also referred to as a “geometrical” approach. It starts with the recognition that the total cost for all Postmasters across all grades can be computed by the sum of two products. To calculate a variability for a given EAS grade pair, the algorithm modifies the total Postmaster cost equation by replacing the counts of the numbers of offices in the higher and lower EAS grades with the sums of the probabilities of an office being in either the higher or lower EAS grade, as determined by the logit model. This leads to the derivation of the equation from which the variability can be calculated.

The Postal Service carefully considered and evaluated the two proposed methods to determine which one would provide a stronger foundation for calculating Postmaster attributable costs. In that evaluation, two primary criteria were applied:

1. Does the method require any additional assumptions or estimations and how open ended are they?
2. How well does the method comport with the underlying economic theory of calculating attributable costs?

A careful evaluation of the two methods lead to a determination that the MEDBPAC approach is preferred. It has some relative advantages, and there are some relative disadvantages to the LSVPTV approach.

First, the LSVPTV method involves calculating the limit of the variability function (if it exists), not calculating the variability directly from the variability function itself. The LSVPTV approach also requires assuming that there is an infinite number of post offices, which may not be too troublesome of an assumption for the EAS-18 to EAS-18B

⁵ *Id.* at 12.

variability, where there are 8,648 post offices across the two EAS grades, but is a real issue for other variability calculations where there are far fewer post offices in the two EAS grades. In addition, the LSVPTV method requires non-parametric estimation of the continuous probability distribution of the WSCs for each pair of post offices. As the Commission pointed out, there are a variety of methods available for this estimation, but all of them require some judgement, and thus impart some arbitrariness to the estimation.⁶ The need to make such decisions raises a potentially controversial issue in calculating the variabilities. It also adds another step of complexity, and effort, in computing the variabilities. Finally, the calculated LSVPTV variability turns out to be the variability of cost with respect to the threshold WSC level, not WSCs directly, which may raise issues for the calculation of incremental costs.

One relative advantage of the MEDBPAC approach is that it is much closer in form to established methods of variability calculation. It is also transparent, and it does not require another layer of assumptions and estimations. That is, it can be calculated directly from the existing logit models without any additional estimation. The MEDBPAC method also makes use of the actual distribution of WSCs across post offices in calculating the variability, ensuring that the variabilities reflect the underlying cost surface. Finally, it is consistent with the economic theory underlying attributable cost calculation. In fact, the MEDBAC formula can be derived using traditional variability methods.

⁶ See, File A5: Suggested Approaches to Address the Shortcomings of Proposal Ten, Library Reference (Suggested Approaches), PRC-LR-RM2020-2/5, Docket No. RM2020-2, July 9, 2021 at 10.

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In sum, the MEDBPAC approach is more transparent, requires no additional estimations, is straight-forward to calculate, and is consistent with the economic theory underlying the calculation of attributable costs. Therefore, it is the preferred of the two methods.

The logit models used in Docket No. RM2020-2 were estimated on Form 150 WSC data from 2019. Given that three years have passed since those data were collected, it seems appropriate to extract the same type of data for 2022 from the Postal Service's electronic Form 150 data system, and to estimate the logit models on more recent data. Not only does this effort update the variability analysis to the most recent data available, but also it demonstrates the stability of the logit models. As with the Docket No. RM2020-2 models, the Cox-Snell R^2 statistics for the six 2022 logit models indicate that they all fit their respective datasets well. In addition, the 2022 Hosmer-Lemeshow statistics indicate that the null hypotheses of good-fitting models cannot be rejected for any of the EAS grade pairs.

All of the estimated parameters in the six logit models are statistically significant. In addition, like in the Docket RM2020-2 results, the estimated WSC coefficients decline as one moves from the lower-level EAS grades to higher-level EAS grades. This decline reflects the fact that the width of the WSC band, per grade, widens as the EAS grade increases. For example, the width of the WSC band for the EAS-20 grade is 7,499 WSCs, while the width of the WSC band for the EAS-22 grade is 42,199 WSCs. When the band is wider, a given-sized increase in WSCs is less likely to lead to a change in EAS grade and that fact is captured by the smaller estimated WSC coefficients.

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After the 2022 logit models are estimated, the 2022 variabilities can be calculated. A first step in estimating them is to confirm that the Postal Service's version of the MEDBPAC algorithm produces the same results as the original MEDBPAC algorithm proposed by the Commission. This can be done by applying the Postal Service's algorithm to 2019 data to calculate the 2019 variabilities using the same data and logit models used by the Commission. The results of the two versions of the methodology are identical for four of the six EAS grade pairs, and are sufficiently close for the remaining two to be confident that the Postal Service's application of the MEDBPAC approach is producing the same variabilities as the Commission's original application.

The 2022 Postmaster variabilities depend not only on the logit models estimated on the 2022 WSC data, but also the EAS salary schedule for 2022. For the higher EAS grades, the minimum salaries increased in the 8 to 9 percent range over three years from 2019 to 2022. But the minimum salaries on the lower end of the EAS scale increased more sharply. The EAS-18 and EAS-18B grades experienced relatively large increases in minimum salary over the period, in the range of 22 to 23 percent, while the EAS-20 salary increased by 16.6 percent.

There was a larger absolute increase (in dollar terms) for the EAS-18B grade salary than for the EAS-18 grade salary. As a result, the size of the minimum salary gap between the two grades increased from \$5,219 to \$7,201. This would put upward pressure on the EAS-18 and EAS-18B variability. On the other hand, the gap between the EAS-18B and EAS-20 minimums salaries fell from \$6,000 to \$3,033. Finally, the relatively large gain in the EAS-20 minimum salary reduced the gap between the EAS-

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20 and EAS-21 minimum salaries from \$5,700 to \$740. These two reduced salary gaps put downward pressure on the respective variabilities as the cost consequences of changing EAS grades were reduced.

Table 1 presents the variabilities calculated on the 2022 WSC and 2022 EAS minimum salary data, as well as the 2019 variabilities for comparison.

Table 1: Calculated Variabilities Using 2019 and 2022 Data

EAS Grade Pairs	2019	2022	Change
18-18B	4.80%	5.47%	0.67%
18B-20	5.35%	2.19%	-3.16%
20-21	4.77%	0.57%	-4.20%
21-22	2.05%	2.24%	0.19%
22-24	5.38%	5.09%	-0.28%
24-26	8.04%	7.83%	-0.21%

Source: Compare 2019 and 2022 Variabilities.xlsx

Three of the estimated variabilities were very stable, as their values in 2022 were very close to their values in 2019. The 2022 variabilities for EAS-21, EAS-22, and EAS 24 are all about a quarter of a percentage point (in absolute value) from their respective 2019 values. But the variability for EAS-18 shows modest change and the EAS-18B and EAS-20 variabilities show substantial change.

The gap between the EAS-18 and EAS-18B minimum salaries increased from \$5,219 to \$7,201. The larger gap implies that there is a larger cost effect in 2022 of a change between the two grades. This would cause the cost variability to be larger in 2022. In contrast, the gap between EAS-18B minimum salary and EAS-20 minimum

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salary was nearly cut in half. The much smaller salary difference between the two grades means that there is less cost response from an office changing between the two grades. This would cause the variability to be substantially smaller. The same effect occurred for the EAS-20 and EAS-21 minimum salaries. The salary gap between the two fell to just \$740. Such a small salary difference between the two grades means that there is very little cost response from an office changing between the two grades. This would cause the variability to be much smaller.

To confirm that the salary change is the source of the change in the EAS-18B and EAS-20 variabilities, one can calculate the variabilities using the parameters from the logit models estimated on the more recent 2022 WSC data, while continuing to use the 2019 EAS minimum salary schedule. This approach isolates the effects of any parameter changes, as the salary schedule does not change. Comparing the variabilities based upon both the 2019 logit models and the 2019 EAS salary schedule with those based upon the 2022 logit models and the 2019 EAS salary schedule shows the variabilities for all EAS grades to be very close to one another, including grades EAS-18B and EAS-20. This means that the difference between the 2022 variabilities and the 2019 variabilities for these two grades is coming from the change in the 2022 salary schedule, and the 2022 variabilities are thus accurately reflecting the changes in costs that would be incurred in 2022 due to EAS grade changes.

Impact

In the established version of the Postmaster cost model, a single variability is applied against the costs for EAS grades 18 through 22.⁷ Grades EAS-24 and above receive a zero variability, by assumption. The new variability structure is different, with the costs for each of the EAS grades below EAS-26 receiving its own variability, including EAS-24. The overall variability can be calculated by first calculating the total volume variable costs implied by the individual EAS grade variabilities and then dividing that sum by total accrued costs. That calculation produces an overall variability of 3.03 percent.

The new variability is lower than the existing variability for three reasons. First, as explained in Docket No. RM2020-2, the Docket No. R84-1 variability currently in use is overstated due to a computational error. Correcting that error reduces the current variability. Second, POSTPlan eliminated the lower EAS grades. In the lower grades, Postmasters could move relatively rapidly, in terms of additional WSCs, to a higher salary. In higher EAS grades, much larger increases in WSCs are required to move to a higher grade a higher salary. Eliminating the lower EAS grades means that a given percentage increase in volume is less likely to create an increase in cost -- creating a lower variability.

Third, the Docket No. R84-1 approach measured only the potential increase in cost from an increase in WSCs, not the actual increase. The Docket No. R84-1 methodology did not account for the amount of WSCs Postmasters are actually earning

⁷ See, CS01-Public-FY21.xlsx at Tab 1.01.

(captured by the distribution of offices, by WSCs, within each grade), nor did it attempt to measure how quickly the existing complement of Postmasters would move up a grade if WSCs increased. As a result, it tended to overstate the variability because it implicitly assumed that all offices would change grades when WSC changed.

In contrast, the Commission's MEDBPAC approach averages the variabilities calculated at each post office included in the dataset used to estimate the logit models. It incorporates the distribution of WSCs across offices and reflects the actual, not potential, changes in cost associated with a given change in WSCs. Given that most post offices have WSC levels that imply that they are unlikely to change EAS grades in response to a WSC change, the actual variability should, and does, lie below the R84-1 potential variability.

A reduction in volume variable costs will translate into a reduction in the unit Postmaster costs, as illustrated in Table 2. That table shows the unit Postmaster costs, including piggyback costs, using both the new and the existing variabilities.⁸ Because unit Postmaster costs are low to begin with, the reduction in variability does not have a large impact on those costs.

For example, First Class Mail unit costs fall by \$0.0020, two-tenths of a cent, and Marketing Mail unit costs fall by one-tenth of a cent. The impact for package products is slightly larger and total Package Services unit Postmaster costs fall by seven-tenths of a cent. Competitive unit costs fall by 1.98 cents.

⁸ The impact of the new variabilities on competitive products are presented in the non-public file, Non Public Impact.xlsx in USPS-RM2022-8-NP1.

Table 2
Impact of New Variabilities

Domestic Market Dominant Products	New Variabilities	Existing Variabilities	Difference
Single-Piece Letters	\$0.0005	\$0.0030	-\$0.0025
Single-Piece Cards	\$0.0003	\$0.0020	-\$0.0017
Presort Letters	\$0.0004	\$0.0022	-\$0.0018
Presort Cards	\$0.0003	\$0.0015	-\$0.0012
Single-Piece Flats	\$0.0015	\$0.0087	-\$0.0072
Presort Flats	\$0.0009	\$0.0052	-\$0.0043
Total First-Class Mail	\$0.0004	\$0.0025	-\$0.0020
High Density and Saturation Letters	\$0.0002	\$0.0009	-\$0.0008
High Density and Saturation Flats/Parcels	\$0.0002	\$0.0010	-\$0.0008
Every Door Direct Mail-Retail	\$0.0002	\$0.0010	-\$0.0009
Carrier Route	\$0.0003	\$0.0015	-\$0.0012
Letters	\$0.0002	\$0.0012	-\$0.0010
Flats	\$0.0004	\$0.0023	-\$0.0019
Parcels	\$0.0014	\$0.0083	-\$0.0068
Total USPS Marketing Mail	\$0.0002	\$0.0012	-\$0.0010
In County	\$0.0001	\$0.0006	-\$0.0005
Outside County	\$0.0003	\$0.0015	-\$0.0012
Total Periodicals	\$0.0002	\$0.0014	-\$0.0011
Bound Printed Matter Flats	\$0.0007	\$0.0042	-\$0.0034
Bound Printed Matter Parcels	\$0.0011	\$0.0062	-\$0.0051
Media/Library Mail	\$0.0035	\$0.0201	-\$0.0166
Total Package Services	\$0.0014	\$0.0084	-\$0.0069
Total Domestic Market Dominant Mail	\$0.0003	\$0.0018	-\$0.0015
Total Domestic Competitive Mail and Services	\$0.0041	\$0.0239	-\$0.0198
Total International Mail and Services	\$0.0049	\$0.0286	-\$0.0236

Source: Public Impact.xlsx